

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1-4. (Canceled)

5. (New) A porous honeycomb structure comprising:

a plurality of partition walls containing cordierite as a main component and comprising a porous ceramic having a porosity of 55 to 75% and an average pore diameter of 15 to 35 μm ,

characterized in that pores of the partition walls have a pore distribution represented by the following condition formula (1):

$$L_r > 0.3 \times P / 100 + 0.91 \dots (1),$$

"in the above condition formula (1), L_r means an average developed length ratio obtained by the following equation (2), and P means a porosity obtained from a total pore volume measured by a mercury press-in type porosimeter, assuming that a true specific gravity of cordierite is 2.52 g/cc:"

$$L_r = L_o / 4 \dots (2),$$

"in the above equation (2), L_o means an average developed length (an average value of lengths including the surfaces of the pores opened in the partition wall surfaces) obtained when using a surface roughness measuring instrument and checking optional ten places on the partition wall surfaces every 4 mm (straight line length ignoring presence of the pores opened in the partition wall surfaces) along the partition wall surfaces with a stylus, and L_r means the average developed length ratio."

6. (New) The porous honeycomb structure according to claim 5, wherein the pores of the partition walls have a tomographic pore distribution represented by the following condition formula (3) in a partition wall thickness direction:

$$X < -33 \times P/100 + 28 \quad \dots (3),$$

"in the above condition formula (3), X denotes an average value of a primary component amplitude spectrum (F) and a secondary component amplitude spectrum (S) obtained from the following equations (4) and (5), and P means a porosity obtained from the total pore volume measured by the mercury press-in type porosimeter, assuming that the true specific gravity of cordierite is 2.52 g/cc:"

$$F = \sqrt{X_{SRe}(1)^2 + X_{SIm}(1)^2} \quad \dots (4)$$

"in the above equation (4), F denotes the primary component amplitude spectrum assuming $k = 1$ in the following conversion equation (6), and $X_{SRe}(1)$ and $X_{SIm}(1)$ denote a real part and an imaginary part, respectively, assuming $k = 1$ in the conversion equation (6):"

$$S = \sqrt{X_{SRe}(2)^2 + X_{SIm}(2)^2} \quad \dots (5)$$

"in the equation (5), S denotes the secondary component amplitude spectrum assuming $k = 2$ in the following conversion equation (6), and $X_{SRe}(2)$ and $X_{SIm}(2)$ denote a real part and an imaginary part, respectively, assuming $k = 2$ in the conversion equation (6),"

$$X_s(k) = \sum_{n=0}^{255} x(n) \left(\cos \frac{2\pi k}{256} \cdot n - j \sin \frac{2\pi k}{256} \cdot n \right) \quad \dots (6)$$

"in the conversion equation (6), $X_s(k)$ denotes a discrete Fourier transform, k denotes a degree, n denotes an integer of 0 to 255 indicating a divided position, when a partition wall section is divided into 256 in order in a thickness direction from a partition wall outermost surface portion ($n = 0$), and $X(n)$ denotes an area ratio occupied by a pore portion in a partition wall section region to the divided position of n to $n+1$."

7. (New) The porous honeycomb structure according to claim 5, wherein a thickness of the partition wall is 350 μm or less.

8. (New) The porous honeycomb structure according to claim 6, wherein a thickness of the partition wall is 350 μm or less.

9. The porous honeycomb structure according to claim 5, wherein a coefficient of thermal expansion at 40 to 800°C is $1.0 \times 10^{-6}/^\circ\text{C}$ or less.

10. The porous honeycomb structure according to claim 6, wherein a coefficient of thermal expansion at 40 to 800°C is $1.0 \times 10^{-6}/^\circ\text{C}$ or less.